

Decision Number Three to the Treaty on Open Skies

Methodology for Calculating the Minimum Height Above Ground Level at Which Each Optical Camera Installed on an Observation Aircraft May be Operated During an Observation Flight

The States Parties to the Treaty on Open Skies, pursuant to the provisions of Annex D, Appendix 1, Section III, paragraph 2 of the Treaty on Open Skies, have agreed as follows:

The methodology for calculating the minimum height above ground level at which each optical camera installed on the observation aircraft may be operated during an observation flight, shall be as follows:

- (A) determine the ground resolution of the optical camera (lens/filter/film combination) at the altitude from which the calibration target was photographed, from a visual analysis of the image of the calibration target (across track and along track) on the original film negative. The value of the ground resolution shall be equal to the width of a single bar in the smallest group of bars which can be distinguished as separate bars, in centimeters;
- (B) produce a $\Delta \log E$ curve for the film using a densitometer to measure the densities of a 21-step sensitometric strip exposed on the film by a sensitometer prior to the flight;
- (C) determine the effective modulation of the calibration target from an analysis of the image of the calibration target on the original film negative by electronic means or, if that is not possible, by comparison with a calibrated sensitometric strip on the film;
- (D) calculate the height above ground level at which the optical camera would achieve a ground resolution of 30 centimeters against a target which has the agreed modulation of 0.4, or equivalent contrast ratio of 2.3 to 1, against its background; and
- (E) determine the mean value of the height above ground level obtained from paragraph (D) from at least five passes over the calibration target, as follows:

$$H_{\min} = 1/n \sum_1^n H_1 [L_a/L_2][K_1/K_2]^m$$

where:

H_{\min} is the mean value of the minimum height above ground level, in meters;

- n is the total number of passes over the calibration target;
- H_1 is the aircraft height, in meters, at the moment the calibration target was photographed;
- L_a is the agreed ground resolution of 30 centimeters;
- L_2 is the ground resolution, in centimeters, obtained from paragraph (A);
- K_1 is the agreed modulation of 0.4 at which ground resolution is defined;
- K_2 is the effective modulation obtained from paragraph (C) as follows:

$$K_2 = C-1/C+1 \text{ where } C = 10^{\Delta \log E}$$

where:

- $\Delta \log E$ is the difference in the logarithm of the exposures between the black and white bars on the calibration target;
- m is the agreed corrected exponent value of 0.45.

This value shall represent the certified minimum height above ground level, in meters, at which the optical camera (lens/filter/film combination) may be operated during an observation flight.

This Decision shall enter into force simultaneously with the Treaty on Open Skies and shall have the same duration as the Treaty. Decided in Vienna, in the Open Skies Consultative Commission, on 29 June 1992, in each of the six languages specified in Article XIX of the Treaty on Open Skies, all texts being equally authentic.